SCREENING SITE INSPECTION
SITE EVALUATION REPORT FOR
MASTER METALS, INCORPORATED
CLEVELAND, OHIO
OHD 097 613 871

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
Site Assessment Section
Chicago, IL 60604

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1.0 INTRODUCTION

Under Contract No. 68-W8-0084, Work Assignment No. 29-5JZZ, PRC Environmental Management, Inc. (PRC), evaluated the Master Metals, Inc. (MMI), site in Cleveland, Cuyahoga County, Ohio, as a potential candidate for the National Priorities List (NPL) and prepared this draft screening site inspection (SSI) site evaluation report (SER). Using the Hazard Ranking System (HRS), PRC evaluated the site to determine if, or to what extent, it poses a threat to human health and the environment. This report summarizes the site conditions and targets pertinent to the migration and exposure pathways associated with the MMI site. Information was obtained from the Ohio Environmental Protection Agency (OEPA); the U.S. Environmental Protection Agency (EPA) Site Assessment Branch; the EPA Resource Conservation and Recovery Act (RCRA) branch; the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA); the Northeast Ohio Regional Sewer District (NEORSD); and local Cleveland agencies. PRC conducted an off-site reconnaissance inspection of the site on December 15, 1993. Photographs taken during the inspection are included in Appendix A. Based on the information available, the MMI site will receive a preliminary HRS score of 28.50 or greater.

This SER has six sections, including this introduction. Section 2.0 describes the site. Section 3.0 discusses site operations and history. Section 4.0 provides information about PRC's off-site reconnaissance. Section 5.0 describes each source associated with the site. Section 6.0 provides information about the four migration and exposure pathways (groundwater migration, surface water migration, soil exposure, and air migration). Section 7.0 presents a summary of PRC's site evaluation.

2.0 SITE DESCRIPTION

MMI is an inactive secondary lead smelting facility located at 2850 West Third Street, Cleveland, Cuyahoga County, Ohio. The facility recycled lead-bearing wastes such as batteries, flue dust, scrap metal, and lead dross. The site is located in a heavily industrialized section 1 mile south of downtown Cleveland in an area known as "the flats." West Third Street borders the site on the east and the south. Ling-Tempco-Vought (LTV), an 800-acre steel mill is located to the east of West Third Street. An abandoned asphalt company occupies the property immediately south of West Third

Street. The LTV property extends south of the abandoned asphalt company. B&O Railroad yards border the site to the north and west. Dozens of other industries are located nearby along the Cuyahoga River, which is located 1300 feet east of the site. Land within 1 mile of the MMI site is used for both industrial and residential purposes (see Figure 1).

According to available records, the MMI facility is located on top of slag material that was deposited in the 1930s. The site property consists of approximately 5 acres, 0.5 acre of which is occupied by an inactive railroad roundhouse used to store lead product prior to off-site shipment. The remaining property consists of a smelting building that has two rotary furnaces, a white metal building that houses several pot furnaces and their associated baghouses, 14 or more outdoor storage bins, four aboveground fuel tanks, a liquid oxygen tank, and an office building (see Figure 2). During its off-site reconnaissance, PRC observed several air monitoring stations, several monitoring wells, and a sprinkler system used to reduce fugitive dust emissions.

3.0 SITE OPERATIONS AND HISTORY

This section presents information about the MMI site's operational and regulatory history as well as previous investigations conducted at the site. Section 3.1 presents information about former operations at the MMI site. Section 3.2 presents information about the site's regulatory history. Section 3.3 describes previous investigations conducted at the MMI site. The information in these three subsections was acquired from state and federal EPA, OSHA, and NEORSD files dating from 1980 to 1993. Actual analytical data referenced in this section are discussed in Section 5.0.

3.1 OPERATIONAL HISTORY

Between 1933 and 1979, National Lead Industries, Inc. (NL), of Highstown, New Jersey, owned and operated a secondary lead smelter at the site. As part of its smelting operations, NL obtained automobile batteries and other lead-bearing materials for use as feed stock in its smelter (OEPA 1984). In 1935, NL installed a baghouse to capture particulate matter generated by the two rotary furnaces. In 1968, NL constructed three more baghouses to capture particulate matter generated by the pot furnaces (EPA 1987).

SCALE 1:24000

1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

SCALE: 1" = 2,000'

QUADRANGLE LOCATION

MASTER METALS, INC.
CLEVELAND, OHIO

FIGURE 1
SITE LOCATION

SOURCE: MODIFIED FROM USGS, CLEVELAND SOUTH, OHIO, QUADRANGLE, 1984

ENVIRONMENTAL MANAGEMENT, INC.

In 1979, NL sold the plant to Douglas Mickey, who continued operating the plant as previously described under the name Master Metals, Inc. During its operations, MMI processed lead acid batteries and a variety of other lead-bearing materials using a secondary smelting process. A combination of rotary and pot furnaces were used to convert the lead-bearing feed material into lead ingots (MMI 1980). MMI received lead-bearing materials from off-site sources (MMI 1987). MMI employed 95 people over three shifts, 5 days a week (NEORSD 1980a).

Lead-bearing feed material, other than batteries, was transported to the MMI facility and stored on site in one of two ways: (1) in bins, boxes, or drums or (2) stock-piled directly on the ground surface. MMI used a bulldozer to move feed material from storage areas to the furnaces. Batteries were stored at two locations on site. Originally, batteries were stored in the former dismantling building, which was located in the site's southwest corner (now the container storage area). Later, batteries were stored near the main gate (see Figure 2). Batteries were cracked in the battery storage area near the main gate (see Figure 2). Lead-bearing portions of the batteries were then transferred to the facility's furnaces for reclamation.

The MMI facility's rotary furnaces and pot furnaces could process up to 7,000 tons of lead-bearing materials each hour (MMI 1980). Lead-bearing feed material was classified and regulated by the EPA as D008 hazardous waste. In 1980, MMI estimated that it generated 42,960 tons of D008 waste per year (MMI 1980).

In order to mitigate particulate emissions from the furnaces, each furnace stack was fitted with a baghouse to collect particulate materials. According to MMI's Part A application, particulate materials, called baghouse dust or emission control dust (ECD), and the sludge remaining in the furnaces were both classified and regulated by EPA as K069 hazardous waste (MMI 1980). The ECD generated by MMI was approximately 60 percent lead (OEPA 1983). In 1980, MMI estimated that it generated approximately 1,920 tons of K069 waste per year (MMI 1980).

In addition to lead-bearing materials, MMI used sodium nitrate and anhydrous ammonia during its smelting operations. During smelting, sodium nitrate was added to the feed material to facilitate ammonia oxidation. Anhydrous ammonia was stored on site in an 8,000-gallon steel tank. Based on

file information, it is unclear if this tank is above or below ground. Moreover, it is unclear when the facility began using this tank, but the tank was no longer in use as of March 1990 (MMI 1990a).

The by-products of the smelting operation included furnace flux, slag, dross, ECD, and ECD sludge. The furnace flux, dross, ECD, and associated sludge were recycled in the facility's furnaces. Cooling water was diverted to the City of Cleveland sewer system. Furnace slag was routinely tested for extraction procedure (EP) toxicity criteria and shipped off site for disposal (OEPA 1983; EEI 1987b and 1987c).

Four aboveground storage tanks are also present on site (see Figure 2): one tank was used to store diesel fuel, one was used to store motor oil, one was used to store gasoline, and one was used to store hydraulic fluid. Each of these tanks has a 500-gallon capacity. A fifth tank, which has a 10,000-gallon capacity, was apparently used by NL but not by MMI (MMI 1990b). This tank was most likely used to store diesel fuel; however, the file information available does not conclusively demonstrate this fact.

Finished lead ingots were stored in the roundhouse at the north end of the property until being shipped off site. MMI primarily sold its lead ingots to battery manufacturers. In 1980, MMI produced an estimated 15,000 tons of lead ingots. The above-described operations have resulted in many regulatory infractions, which are detailed in Section 3.2. In 1990, MMI's Resource Conservation and Recovery Act (RCRA) and OSHA violations became a subject of interest to the media, which is still actively following the site's story.

3.2 REGULATORY HISTORY

This section is divided into three subsections: (1) RCRA Regulation, (2) OSHA Regulation, and (3) NEORSD/Sewer Discharge and Air Emissions Regulation. These subsections detail the MMI site's history as it relates to each regulatory statute.

3.2.1 RCRA Regulation

In November 1980, MMI submitted a RCRA Part A permit application. The Part A permit application states that the facility had a container storage area (S01) capable of storing 152 gallons of material, tank storage capable of storing 600 gallons of material, and six waste piles used to store 687 cubic yards of material. The facility also stated that it operated an incinerator treatment system (T03) process capable of handling 20 gallons per hour, a blast furnace process (T03) capable of processing 7 tons of material per hour, and a pot furnace process (T04) capable of handling 7 tons of material per hour. MMI stated that it handled 44,880 tons of lead-bearing material annually. Of this material 42,960 tons was designated D008 waste and 1,920 tons was designated K069 waste (MMI 1980).

In September 1985, OEPA requested that MMI submit a RCRA Part B permit application for the facility's six waste piles. Subsequent to MMI's submittal of this application, OEPA sent MMI notices of deficiency in January and June 1986 (OEPA 1986a, OEPA 1986b). However, OEPA granted MMI interim status for the waste piles in spite of the information that was missing from the Part B application. After not responding to the notices of deficiency, MMI lost its interim status for the six waste piles in 1986 (PRC 1986). In July 1986, OEPA referred a case against MMI to the U.S. Department of Justice (DOJ) based on the facility's loss of interim status (OEPA 1986c).

On February 26, 1987, MMI submitted its 1986 Annual Hazardous Waste Report, which listed a variety of lead-bearing materials as being received by MMI and later used as feed material for the facility's smelter. Lead and tin dross were transported to the MMI facility by the following companies: U.S. Steel, the Sperry Corporation, Vernitron, Keystone Resources, Continental Can Company, Central Can, and Atlantic Battery. Lead flue dust was transported to the facility by Seitzinger and E.I. DuPont DeNemours, and silicate (china clay waste) was transported to the facility by Lenox China. MMI also received and processed batteries, Polaroid™ film papers, copper wire, insulation, and solder bars of lead (MMI 1987).

In February 1987, A.T. Kearney, Inc., and Harding Lawson Associates conducted a RCRA facility assessment that consisted of a preliminary review and visual site inspection (PR/VSI). During this inspection, 23 solid waste management units (SWMU) were identified, including 10 waste piles used to store batteries and K069 and D008 wastes, 8 storage areas, 4 air emission baghouses, and 1 former

acid waste treatment unit. During the PR/VSI, it was observed that raw and waste materials, including D008 and K069 wastes, at MMI were being stored in areas with poor containment. According to the PR/VSI, MMI's SWMUs had a high potential for release to the surface water and air migration pathways (A.T. Kearney 1987).

In August 1987, Envisage Environmental Incorporated (EEI) of Richfield, Ohio, submitted a partial facility closure plan to EPA and DOJ on behalf of MMI. This report presents a plan for closing only the waste piles used to store D008 and K069 wastes. According to EEI, additional SWMUs would be addressed under a long-term facility closure plan to be submitted at an unspecified later date. As part of the partial closure plan, EEI collected subsurface soil samples from the battery storage area waste pile (EEI 1987a). Soil collected in this area was predominantly composed of slag and cinders that contained cadmium and lead; however, the concentrations were not considered toxic according to EP toxicity criteria. Groundwater was encountered between 3 and 10 feet below ground surface (bgs) and was found to contain high concentrations of lead (EEI 1988).

In September 1987, OEPA received an anonymous complaint against MMI, stating that slag and batteries from MMI were being disposed of at a landfill in Aurora, Ohio (OEPA 1987). Analysis of a sample collected by OEPA at the landfill revealed concentrations of lead and cadmium greater than the EP toxicity standard (WAL 1987). Samples collected from MMI slag piles also showed levels of lead and cadmium at concentrations greater than EP toxicity standards (EEI 1987b and 1987c). As a result, OEPA ordered all that all slag generated at MMI be handled as a hazardous waste (OEPA 1988a and 1988b). The owner of the landfill cooperated with OEPA in removing all MMI waste slag from the landfill. This waste slag was transported back to MMI, where it was reprocessed in the facility's furnace (OEPA 1988b).

During an unannounced RCRA inspection in April 1988, OEPA noted uncovered waste piles, battery acid dripping onto the ground, and puddles of liquid with a pH of less than 2 (OEPA 1988c). In October 1988, the Cleveland Fire Prevention Bureau conducted an unrelated inspection at the MMI facility that revealed many violations, including a lack of permits for storing or using hazardous materials and improperly labeled waste. The Cleveland Fire Prevention Bureau also said that the structural integrity of all the MMI buildings needed to be documented and that the buildings should be razed, if necessary, based on their unstable appearance (City of Cleveland 1988).

In January 1990, MMI entered into a consent agreement with EPA as a result of continued RCRA violations. The consent decree required MMI to properly track all hazardous wastes on site, to submit annual reports to OEPA, and to cease cracking batteries on site. These activities were suspended until MMI could prove it was in full compliance with RCRA as a treatment, storage, and disposal facility and could submit a contingency plan and a closure plan for all the RCRA-regulated SWMUs previously identified. The consent decree required that an investigation be conducted to determine subsurface and groundwater conditions at the facility. The consent decree also required MMI to characterize waste on site, to store waste properly, and to remove or process all china clay waste (U.S. District Court 1990).

In March 1990, Woodward-Clyde Consultants submitted a partial closure plan on behalf of MMI. The partial closure plan itemized the steps necessary to close the waste piles, battery cracking area, and former container storage area (WCC 1990). In April 1990, EEI submitted a RCRA Part B permit application for these SWMUs on behalf of MMI (EEI 1990a).

In December 1990, Compliance Technologies, Inc., of Solon, Ohio, was contracted by MMI to conduct a Phase II environmental assessment of the MMI site to satisfy the 1990 consent decree requirements. Thirty subsurface soil samples were collected and four monitoring wells were installed on site. Slag was encountered at depths of up to 10 feet beneath the site. Strong, unidentifiable odors were present in several borings as well. Elevated concentrations of barium, cadmium, chromium, lead, and nickel were detected in these borings. The on-site soil samples, which were collected at a depth of 1 foot bgs, were found to contain lead at concentrations as high as 14,070 milligrams per kilogram (mg/kg) (CTI 1991a). These metals were also detected in the groundwater beneath the site (CTI 1991b).

On August 12, 1991, OEPA collected samples of raw materials from the MMI rotary furnace and from two waste bins as part of the consent decree requirements. EP toxicity extract contained lead concentrations as high as 5,340 mg/L (RECRA Environmental, Inc. 1991).

Between 1990 and 1992, MMI submitted the partial closure plan discussed above, a battery cracking plan, a contingency plan, a waste analysis plan, and a facility inspection plan. MMI received notices of deficiency for all of these plans (EPA 1990a, 1990b, 1990c, 1990d, 1990e, and 1991). EPA also

notified MMI that it had not adequately demonstrated its financial ability to assure clean closure of the facility (EPA 1991).

In November 1993, MMI began negotiations with its feed material suppliers to collect money to clean up the facility under RCRA regulations (Rutigliano & Associates Co. L.P.H. [R&A] 1993). By this time, the facility faced $1.6 million in stipulated RCRA penalties. Furthermore, MMI attorneys suggested that is was unlikely that MMI could operate in accordance with state and federal standards without significant remediation (R&A 1993). Because MMI could not demonstrate that it has the financial resources to assure clean closure of its facility, EPA determined that the facility's cleanup should be addressed under CERCLA.

3.2.2 OSHA Regulation

In June 1986, OSHA determined that the average MMI employee was being exposed to lead at a level of 430 micrograms per cubic meter ($\mu g/m^3$) of air over an 8-hour time-weighted average (TWA). This level of lead exposure far exceeded the OSHA-published permissible exposure limit (PEL) of 0.05 mg/m^3 (50 $\mu g/m^3$) (DOL 1987 and 1988; National Institute of Occupational Safety and Health [NIOSH] 1990). Between August 3, 1987, and February 24, 1988, MMI was penalized for four other OSHA violations and a failure to abate these alleged violations. Some of these violations included repeated employee exposure to airborne lead concentrations greater than the OSHA PEL in both the front office and the employee lunch room, lack of respiratory protection, and improperly labeled hazardous waste containers (DOL 1987 and 1988).

In some cases, employees were not notified about their exposure to elevated lead concentrations in the air nor were they given follow-up blood tests. Between April and October 1987, there were eight instances where the blood lead concentrations of two MMI employees revealed concentrations high enough to warrant their removal from the work place. MMI did not remove any of the employees from work and warning signs were not posted on site as required by OSHA (DOL 1987 and 1988).

Between January 11, 1990, and March 23, 1990, OSHA noted many additional violations at the MMI site. These violations again included employee exposure to lead. In at least 41 instances, employees were not informed when their blood lead concentrations exceeded the OSHA standard nor were they

removed from their work areas. Furthermore, airborne lead concentrations continued to remain elevated in the employee lunch room (DOL 1990a and 1990b).

In April 1990, OSHA collected a soil sample from a location 125 feet east of MMI's front gate along West Third Street. An OSHA laboratory tested the soil and found it to contain lead concentrations as high as 2 percent (OEPA 1990). On May 22, 1990, OSHA posted a Notice of Alleged Imminent Danger at the site, warning MMI's 40 employees of the risk they were being exposed to via airborne concentrations of lead at MMI. OSHA also notified MMI's workers that the concentrations at which they were being exposed were cause for removal from the MMI work place (DOL 1990a). OSHA, however, does not have the authority to close a facility based on these reasons (PRC 1993a).

In June 1990, a U.S. District Judge issued a restraining order demanding that MMI employees with high concentrations of lead in their blood be removed from the work place. However, at least seven of the 40 employees were still working on site after this order was given (Plain Dealer 1990). OSHA later discovered that some of the blood lead data it received was altered by MMI to reflect lower blood lead concentrations in MMI employees (U.S. District Court 1990).

In December 1992, Douglas Mickey plead guilty to making false statements to OSHA regarding the lead concentrations detected in the blood of MMI employees. Mickey and his health and safety consultant were both served with a 4-month work-release sentence, 2-years of probation (the first year as home detention), and a $15,000 fine (U.S. District Court 1992).

3.2.3 NEORSD/Sewer Discharge and Air Emissions Regulation

MMI received a permit to operate its furnaces from the City of Cleveland's Division of Air Pollution Control. This permit allowed MMI a maximum production rate of 2,500 pounds of lead per hour. This permit also regulated baghouse maintenance (City of Cleveland 1987).

Wastewater discharges from battery cracking operations at the MMI facility were regulated under Code of Federal Regulations (CFR) Part 421. According to NEORSD, each battery's contents were drained directly onto the ground. It is unclear how long facility operations included this practice. However, at some undetermined date prior to MMI's assuming ownership of the site, waste acid

began to be drained into a runoff pit, where it was neutralized and then discharged directly to the City of Cleveland's storm sewer (NEORSD 1980a).

Beginning in 1980, NEORSD began documenting lead concentrations, other heavy metals concentrations, and low pH values in the MMI sewer line, in the waste acid runoff pit, and in downstream sewer samples (NEORSD 1980b). As a result of these findings, EPA instructed MMI to install an on-site wastewater pretreatment system (NEORSD 1990). By 1988, MMI had replaced the concrete pad beneath the battery cracking area in preparation for the new wastewater pretreatment system.

NEORSD records from 1980 to 1982 also indicated that MMI emitted lead to the air at concentrations of up to 215 milligrams per cubic meter (mg/m^3) and that the facility was discharging lead to the NEORSD system at an average concentration of 48.8 milligrams per liter (mg/L). High concentrations of cadmium, chromium, copper, and zinc, and low pH levels were also detected in the wastewater pretreatment system's effluent.

Between September 1987 and September 1989, 4.3 million gallons per day of wastewater (including MMI's wastewater) bypassed the Cleveland Sewage Treatment Plant. For a period of 2 years, this wastewater was pumped directly into a combined sewer outfall that discharges directly to the Cuyahoga River. This occurred as a result of pump failure at the Mary Street Pump Station (NEORSD 1992).

In January 1988, NEORSD sampled water from the combined sewer outfall pipe. Lead was detected in the wastewater at a concentration of 0.07 mg/L (NEORSD 1988a). NEORSD did not collect surface water samples from the Cuyahoga River at this time. In November 1988, NEORSD sampled the sludge in MMI's runoff pit, which contained material generated during MMI's battery cracking operations. Analytical results obtained from the sludge samples revealed elevated concentrations of lead, copper, chromium, and cadmium (NEORSD 1988b).

NEORSD tested the wastewater in MMI's employees' hand-washing sink, respirator wash, facility wash down, and the truck wash in preparation for installing an on-site pretreatment system. Lead was detected in all of the samples collected, but was detected at its highest concentration

(606.5 mg/L) at the truck wash area. The rinse water from the MMI truck wash area also contained silver (9 mg/L) and antimony (115 mg/L). Zinc was detected in each sample at concentrations as high as 258 mg/L (MMI 1990c).

In January 1992, OEPA installed three ambient air monitoring stations near the MMI site to determine lead concentrations in the ambient air so that the results could be compared to the National Ambient Air Quality Standard (NAAQS) quarterly average for lead, which is 1.5 $\mu g/m^3$. During every sixth day, OEPA monitored the air at the MMI site for lead concentrations. During the first two quarters of 1992, air samples collected from the station immediately downwind of MMI revealed an average lead concentration of approximately 38 $\mu g/m^3$ and 28 $\mu g/m^3$, respectively. These quarterly averages exceeded the NAAQS by 2,393% and 1,707% respectively (EPA 1992, OEPA 1992a). In April and May 1992, four more NAAQS violations were documented by air monitoring stations at MMI. MMI continued operations and, in July 1992, installed a sprinkler system along the West Third Street fence line in an attempt to prevent airborne lead from migrating off site (PRC 1994a).

OEPA's air monitoring stations continued to detect high concentrations of lead (12.30 $\mu g/m^3$) in August 1992. OEPA ordered MMI to cease all lead smelting operations until it could prove compliance with existing regulations (OEPA 1992b). MMI agreed to cease plant operations for 30 days. At the end of August 1992, OEPA permitted MMI to reactivate three pot furnaces, but would not allow MMI to operate its rotary furnaces (OEPA 1992c). OEPA's air monitoring stations located downwind of MMI again detected high concentrations of lead (14.64 $\mu g/m^3$) in September 1992 when compared to upwind samples (OEPA 1993a; EPA 1993a).

In October 1992, OEPA directed MMI to install two additional air monitoring stations, one west of the site and one south of the site. Additionally, MMI was directed to install a meteorological station, to upgrade its battery cracking operations, to conduct further soil sampling, to maintain zero visible emissions, and to initiate a dust suppression program. In response to this last direction, MMI installed a corrugated fence approximately 10 feet tall between the air monitors and the eastern property line in an attempt to reduce the concentrations of lead migrating via the air (PRC 1994a). At this time, OEPA permitted MMI to resume operation of one rotary furnace (OEPA 1992c).

In January 1993, EPA installed four air monitoring stations around the MMI site to confirm OEPA's previous findings and to rule out the possibility of other potential sources of contamination. Samples were collected every third day throughout 1993 to monitor the total amount of suspended particulate and lead concentrations in the air. Despite the shutdown of the facility's furnaces in August 1993, the downwind monitor routinely detected elevated lead concentrations as much as 500 times greater than the upwind concentrations and 33 times the NAAQS quarterly average (EPA 1993a and 1993b).

MMI failed to maintain zero visible emissions, as stipulated by OEPA in October 1992, on numerous occasions between December 4, 1992, and April 30, 1993. Because of continuing NAAQS air violations at the MMI site, the Cleveland Division of Air Pollution Control forced MMI to cease all operations in August 1993 (OEPA 1993b, and 1993c). Shortly after MMI was shut down, Bank One of Akron, Ohio, took possession of all MMI's cash collateral and accounts receivable. From this point on, no funds were available to operate or to complete remediation of MMI. Furthermore, remediation of the wastewater treatment system was incomplete (OEPA 1993d; MMI 1993a).

3.3 PREVIOUS INVESTIGATIONS

The following subsections provide details about residential soil sampling activities that occurred near the Ogle residence, located approximately one mile southwest of the MMI site, and the EPA Technical Assistance Team (TAT) investigation conducted at the MMI site.

3.3.1 Residential Soil Sampling

In September 1991, OEPA began soil sampling activities at 1157 Holmden Avenue. This property is owned by Mr. John Ogle and was allegedly used by MMI to dump waste material in 1989. OEPA conducted an inspection of the Ogle property in response to a compliant by the Ogles. On September 17, 1991, OEPA collected two soil samples from the Ogle's yard. Analysis of these samples showed significant lead and cadmium concentrations (WAL 1991). Furthermore, OEPA observed stained soil, battery casings, and a lack of vegetation on the Ogle property and on neighboring property (PRC 1994b; OEPA 1991). OEPA then required MMI to remove contaminated soils from the Ogle property and neighboring properties (OEPA 1991).

Over the next few months, MMI removed approximately 1,000 cubic yards of soil from the Ogle property and neighboring properties (PRC 1994b; MMI 1991 and 1992). This soil was stored at MMI and later transported off site to Michigan Disposal Inc., Belleville, Michigan (MMI 1993b). In March 1992, OEPA resampled the soil at the Ogle and surrounding properties and discovered additional heavy metal contamination. Lead was detected at concentrations as high as 7,210 mg/kg in soil from the Ogle residence (KES 1992). The Ogle family alleged that their 3-year old child had high blood lead concentrations as a result of elevated lead concentrations detected in soil on the property. Although MMI continued to remove soil from the Ogle property, they contended the contamination detected in the neighborhood may have come from an alternate source or sources (PRC 1994b).

In December 1992, MMI continued soil sampling activities in the Ogle neighborhood as ordered by OEPA. Background samples were collected from nearby yards to determine the natural lead concentrations in the area. In many cases, the lead concentrations in these samples were higher than those found on the Ogle property, suggesting widespread lead contamination of the soil from unknown sources (EOI 1993a). In June 1993, MMI shipped all of the excavated soils from the Ogle activities to Michigan Disposal, Inc., in Belleville, Michigan (MMI 1993b). In 1993, OEPA collected additional soil samples in the Ogle neighborhood. Analysis of these samples detected elevated concentrations of lead (EOI 1993b). OEPA ordered MMI to relocate the residents of the Ogle property. Currently, no one resides at 1157 Holmden Avenue (PRC 1994b).

3.3.2 EPA TAT Investigation

In July 1992, an EPA TAT collected seven surface soil samples at the request of the EPA. These samples were collected to determine if surface contamination at the MMI site was subject to airborne transport. On-site soil samples contained heavy metals, particularly lead, at concentrations ranging from 6,020 to 115,000 mg/kg (E&E 1992). The EPA TAT conducted further sampling at two off-site locations in July 1993, approximately 0.4 mile northwest (Area 1) and west (Area 2) of the site to determine if airborne lead had migrated to the nearby Valleyview Apartments complex and the Tremont Valley Park (see Figure 1 for location of Areas 1 and 2). Surface samples collected from both the Valleyview Apartments complex and the Tremont Valley Park were found to contain elevated lead concentrations ranging from 148 to 1,850 mg/kg. These soil samples were collected from

locations that were within 200 feet of apartments occupied by residents and from the playground and baseball field that are regularly used by children (E&E 1993). However, the source of this contamination cannot be conclusively demonstrated.

4.0 OFF-SITE RECONNAISSANCE

On December 15, 1993, PRC conducted an off-site reconnaissance inspection of the MMI site (PRC 1993b). The purpose of this inspection was to confirm the locations of features found at the site and to document activities at the site. PRC also gathered additional information about the Ogle property and possible receptors of contamination migrating via the Cuyahoga River.

During the off-site reconnaissance, PRC noted that several decrepit buildings were located on site. PRC also noted that storage bins containing what is believed to be lead-bearing material were also located on site (see Photograph No. 1). Site materials were being loaded onto the trailer of a semi-truck that was occupied by a driver. Several other cars were parked at the site during the off-site reconnaissance (see Photograph No. 2). PRC noted that MMI's furnaces were not in operation.

PRC noted that Air Monitoring Station 39-035-0055 and its collocated air monitoring station were located outside MMI's main gate east of the corrugated fence and sprinkler system and west of West Third Street (see Photograph No. 3). Air Monitoring Station 39-035-0057 was located at the south end of the MMI property between West Third Street and the MMI perimeter fence (see Photograph No. 4). Air Monitoring Station 39-035-0062 was located across from the MMI main gate on the east side of West Third Street (see Photograph No. 5). Air Monitoring Station 39-035-0061 and its collocated air monitoring station were located south of MMI on City of Cleveland property south of West Third Street. An abandoned asphalt company still remains on this property (See Photograph No. 6). All the air monitoring stations appeared to be in good condition.

The Ogle residence is located approximately 1 mile southwest of the site on a terrace overlooking LTV Steel. PRC noted that yellow flagging had been posted along the southern border of the Ogle property. A small yard devoid of vegetation was located between the Ogle home and their cyclone fence (see Photograph No. 7). A yard along the side of the Ogle home was filled with gravel and rock (see Photograph No. 8).

After visiting the Ogle residence, PRC visited the Valleyview Apartments, which are located 0.4 mile northwest of the MMI site. PRC verified the locations from which the EPA TAT collected soil samples at this apartment complex (PRC 1993b). These samples were collected within 200 feet of the apartments (see Photograph No. 9). PRC also visited the Tremont Valley Park, which is located 0.4 mile west of the MMI site. The EPA TAT collected soil samples from locations that appeared to contain undisturbed soils; however, a major highway and many industries surround this park (see Photograph No. 10).

The Cuyahoga River, which is the closest surface water body to the MMI site, is located about 1,300 feet east of the site. Over a 2-year period, wastewater from MMI was discharged directly to this river through a combined sewer overflow pipe located next to the Mary Street Pump Station (see Photograph No. 11). The Cuyahoga River empties into Lake Erie about 4 miles downstream of the Mary Street Pump Station discharge point (see Photograph No. 12). No sensitive environments or endangered species were observed along the waterway, nor would they be expected because of the area's industrial nature.

5.0 SOURCE DESCRIPTIONS

This section describes the two major sources of hazardous substances associated with the MMI site. The following data is presented, to the extent possible, based on existing information: a source description, the dates of operation and releases or incidents, and a summary of the sampling activities associated with the source. The locations of the sources associated with the site are shown in Figure 2. Source information was gathered primarily from the PR/VSI, which was conducted on February 10, 1987, by A.T. Kearney, Inc.

5.1 WASTE PILES AND CONTAINERS (Source 1)

Source Description: Lead-bearing feed and byproduct materials were stockpiled at MMI in several outdoor storage areas. Some of these materials were stored in open bins, drums, or boxes, while others were stockpiled directly on the ground surface. Lead-bearing materials consist of lead and tin dross, furnace slag, batteries, ECD, ECD sludge, and scrap metal (MMI 1990a). All of these lead-bearing materials were used to generate lead ingots in the on-site furnaces. All these lead-bearing

materials are classified by RCRA as D008 hazardous wastes, with the exceptions of ECD and ECD sludge, which are classified as a K069 hazardous waste, and scrap metal, which is nonhazardous (MMI 1980).

According to information provided by MMI in a RCRA partial closure plan, approximately 3,050 tons of hazardous waste was present on site as of July 29, 1987. This amount was arrived at based on the information presented in Table 1 (EEI 1987a).

TABLE 1

MMI HAZARDOUS WASTE INVENTORY

RCRA Hazardous Material	Storage Method	Estimated Volume (yd^3)	Estimated Weight (tons)
Dross	Drums	650	800
Dross	Five waste piles	1,500	1,900
Slag	No information available	No information available	No information available
Lead-acid batteries	One waste pile	200	200
ECD	One waste pile	125	150
TOTAL			3,050 tons

While additional information regarding waste quantity at the MMI site exists, a cumulative quantity cannot be provided based on the existing information.

Dates of Operations and Containment: Much of the D008 waste was stored outdoors in bins located throughout the facility (see Figure 2). Each bin was constructed of a floor and three retaining walls constructed of 6-inch, reinforced concrete or wood. The retaining walls were between 3 and 10 feet high. None of the bins were covered (A.T. Kearney 1987). The total capacity of each bin ranged from 500 to 750 cubic yards. MMI used these bins to store D008 and K069 wastes from 1979 to 1993. In many cases, the concrete sides of the bins had deteriorated and many spills and stains have been documented outside of the bins.

Additional D008 and K069 waste was stored as batteries or contained in waste piles, open drums, and boxes. During a 1987 RCRA inspection, drums and boxes were in poor condition and wastes were

also on the ground surface near the drums and waste piles. The batteries were in deteriorated condition and pooled water was present in several nearby locations (A.T. Kearney 1987).

Sampling Activities: In September 1987, EEI sampled the piles of lead slag located at the MMI site. The results of EP toxicity analyses revealed lead concentrations as high as 195 mg/L and cadmium concentrations as high as 93 mg/L (WAL 1987). On September 16, 1987, OEPA sampled slag piles at MMI. Lead was detected in EP toxicity extracts at a concentration of 360 mg/L (EEI 1987b; EEI 1987c).

According to MMI's RCRA Part B permit application, the lead-bearing D008 and K069 wastes contained between 5 and 22,200 mg/kg of lead and up to 88 percent lead-oxide (EEI 1990a). On August 12, 1991, OEPA collected additional samples of the D008 and K069 waste. These samples were analyzed using EP toxicity methods, which revealed lead in the EP extracts at concentrations ranging from 1,170 mg/L to 5,340 mg/L (RECRA Environmental, Inc. 1991).

During these sampling activities, OEPA also collected 61 soil samples directly south and east of the Ogle residence. The analytical results obtained from these samples revealed lead at concentrations ranging from 24.9 to 57,000 mg/kg and cadmium at concentrations ranging from less than 1 to 55.2 mg/kg (KES 1992).

Analytical data for the contents of the drums or boxes is not known to exist. However, in December 1990, Compliance Technologies, Inc. (CTI), of Solon, Ohio, acting as consultants to MMI, collected soil samples from MMI between 1 and 10 feet bgs. Analysis of soil samples collected in the container storage area revealed the following concentrations: lead, up to 970 mg/kg; cadmium, 25 mg/kg; nickel, 170 mg/kg; barium, 72.5 mg/kg; and chromium, 118 mg/kg. Leachable concentrations of lead were detected in the samples collected at a depth of 1 foot bgs (CTI 1991a).

When air monitors were placed on the employees and later at various locations around the site, monitoring results revealed lead concentrations that consistently exceeded OSHA PELs and the EPA NAAQS. Details on these results are presented in Sections 3.2.2 and 3.2.3. MMI employees were also found to have blood lead concentrations greater than 40 μg/100 g of blood as a result of exposure

in the MMI work place. Between September 9, 1987, and November 2, 1987, employees were exposed to lead concentrations as high as 629 $\mu g/m^3$ over an 8-hour TWA (DOL 1987 and 1988).

5.2 FURNACES AND ASSOCIATED BAGHOUSES (Source 2)

Source Description: According to its RCRA Part B application, MMI used two rotary furnaces and several pot furnaces during its smelting operations. The bulk lead-bearing waste stored in the bins and drums was first processed in the rotary furnace and then processed in one of six 60-ton pot furnaces. The resulting metal was then refined and cast into 60-pound ingots. MMI's furnaces could process as much as 7,000 tons of lead-bearing material per hour. According to MMI, the facility processed over 50 million pounds of lead-bearing wastes annually (EEI 1990b; MMI 1980a).

Baghouses were utilized by MMI to capture particulate matter generated from the furnace operations. While four baghouses are present on site, MMI only used two of the four during operation at the site. A nine-cell, brick baghouse is located in the center of the site and was used to collect particulate matter from the rotary furnaces. Each cell is 5 feet by 15 feet by 5 feet tall. Only six of the cells were used. This unit collected approximately 1,200 cubic feet of ECD per month. This unit was never permitted; however, the City of Cleveland monitored its stack emissions.

Pot furnaces at the MMI facility used a sanitary baghouse that is located west of the smelting building. This baghouse consists of 10 cells that collected about 800 cubic feet of ECD per month (EEI 1990b; OEPA 1987). The ECD was determined to contain approximately 60 percent lead (OEPA 1983). According to MMI's RCRA status report for 1990, approximately 1.4 million pounds of ECD was processed on site in 1986 alone (MMI 1990b).

Dates of Operations and Containment: MMI operated the furnaces from the time it purchased the property in 1979 until 1993, when OEPA ordered the facility to cease smelting operations. The Cleveland Department of Air Pollution Control observed excessive dust emissions originating from the MMI furnace stacks on many occasions between March 1991 and June 1992. On several of these instances, the opacity of the stacks' effluent exceeded the 10 percent limitations stipulated in MMI's permit to operate (OEPA 1992b).

The furnace and sanitary baghouses were in operation by MMI between 1979 and 1993. Operations temporarily ceased in August 1992 and were permanently terminated in August 1993 (OEPA 1992b, 1993b, and 1993c). During a February 10, 1987, RCRA facility inspection carried out by A.T. Kearney, ECD was observed around the perimeter of the baghouses (A.T. Kearney 1987).

Sampling Activities: No samples were collected from the furnace stacks. However, on October 15, 1990, EEI sampled and analyzed material in the furnace brick. Leachate from this material contained lead concentrations at 112 mg/L when analyzed using the toxicity characteristic leaching procedure (TCLP) (EEI 1990b). On September 21, 1989, EEI determined the particulate lead emissions to be between 0.010 and 0.057 pound per hour for the furnace baghouse and to be between 0.006 and 0.010 pound per hour for the sanitary baghouse (EEI 1990b).

6.0 MIGRATION AND EXPOSURE PATHWAYS

This section describes the four migration and exposure pathways associated with the MMI site. Section 6.1 discusses the groundwater migration pathway. Section 6.2 discusses the surface water migration pathway. Section 6.3 discusses the soil exposure pathway, and Section 6.4 discusses the air migration pathway.

6.1 GROUNDWATER MIGRATION PATHWAY

This section discusses geology and soils, groundwater releases, and targets associated with the groundwater migration pathway at the MMI site.

The glacial and post-glacial surficial materials in the vicinity of the MMI site consist of tills, lacustrine, and fluvial deposits. The glacial deposits are generally less than 40 feet thick in the site area. Subsurface materials in the site vicinity consist of unconsolidated Pleistocene deposits overlying shale bedrock. The bedrock consists of Paleozoic-age unconsolidated shales and sandstones that range in age from late Devonian to early Pennsylvanian (E&E 1993).

In 1990 and 1991, CTI conducted a subsurface investigation at the MMI site. According to this investigation's results, the MMI facility was built on slag material that extends to at least 10 feet bgs. Several soil borings revealed discoloration and odors in subsurface soils. Groundwater was encountered on site between 3 and 10 feet bgs. According to groundwater measurements taken from four on-site monitoring wells, which are completed to a depth of 10 feet bgs, groundwater flows in a southerly direction beneath the site (CTI 1991a). Although the groundwater flow beneath the MMI site within this upper zone was flowing in a southerly direction at the time of collection, the local groundwater and surface water runoff generally travel toward the Cuyahoga River, which is located east of the site (E&E 1993). At this time, insufficient data are present to determine why this flow anomaly is present at the site.

Groundwater samples collected by CTI during the subsurface investigation were sent to BHM Environmental Laboratory of Chagrin Falls, Ohio. Analysis of these samples revealed lead at concentrations ranging between 0.45 mg/L and 1.35 mg/L and chromium concentrations ranging between 0.02 and 1.33 mg/L. The pH of the groundwater samples ranged between 6.80 and 9.86 (CTI 1991b). No further groundwater sampling has been documented at the MMI site. Furthermore, a sample documenting background conditions at the MMI site has not been collected.

It is believed that lead detected in the groundwater beneath the site is likely attributable to MMI operations or to the slag material found beneath the MMI facility for the following reasons:

- Analysis of on-site soils has demonstrated elevated concentrations of lead ranging from 500 to 14,070 mg/kg to a depth of 10 feet bgs (CTI 1991a).
- Waste piles, drums, baghouses, batteries, boxes, and bins containing lead-bearing waste were stored or operated on site without proper secondary containment (see Section 5.0).

According to the Cleveland Water Department, groundwater is not used as a source of drinking water within a 4-mile radius of the MMI site. Lake Erie supplies the greater Cleveland area with its drinking water (City of Cleveland 1993; PRC 1993c).

6.2 SURFACE WATER MIGRATION PATHWAY

This section discusses the surface water migration route, releases to surface water, and targets associated with the surface water migration pathway at the MMI site.

The Cuyahoga River, which is located 1,300 feet east of the MMI site, is the nearest surface water body to the site. It is unlikely that runoff from the site can migrate to the Cuyahoga River via an overland route because many natural and manmade barriers exist between the site and the river and no streams or ditches lead from the site to the Cuyahoga River (see Figure 1). However, wastewater and runoff from the site were discharged directly to the Cuyahoga River via an outfall located approximately 1,500 feet north-northeast of the site and adjacent to the City of Cleveland's Mary Street Pump Station (PRC 1993d). Analysis of this wastewater documented elevated concentrations of lead.

It is assumed that a release of lead to the Cuyahoga River can be established. Samples of wastewater believed to have been in direct contact with the sludge in MMI's runoff pit, which contained material generated during MMI's battery cracking operations, were collected during the period of time when untreated wastewater was being discharged directly to the Cuyahoga River. Analysis of these samples revealed significant concentrations of lead (98.0 mg/L). Copper, chromium, and cadmium were also detected in these samples (NEORSD 1988b).

According to the U.S. Geological Survey (USGS), the flow rate of the Cuyahoga River is about 832 cubic feet per second (cfs) (USGS 1988). The Cuyahoga River flows in a northwest direction and discharges to Lake Erie about 4 miles downstream from the Mary Street Pump Station. Lake Erie's average depth is 62 feet, but is about 45 feet deep close to the Cleveland shoreline (City of Cleveland 1993).

Four drinking water intakes are located in Lake Erie between 6 and 13 miles downstream of the MMI site. The water from each intake is blended with water from the other intakes prior to being distributed to the 1.5 million customers residing within the greater Cleveland area (City of Cleveland 1993; PRC 1993c).

The Cuyahoga River and Lake Erie are both assumed to be used for fishing. However, the production rates for the Cuyahoga River and Lake Erie are unknown. No wetlands are known to exist along the banks of the Cuyahoga River or the shore of Lake Erie within 15 miles of the site. Furthermore, based on USGS topographic maps, sensitive environments are not believed to exist along the banks of the Cuyahoga River or the shore of Lake Erie within 15 miles of the site.

6.3 SOIL EXPOSURE PATHWAY

Off-site surface soil sampling conducted at the Ogle property revealed elevated lead concentrations (see Section 3.3.1). However, this may not be adequate to establish a release to soils at the Ogle property from the MMI site. MMI denies responsibility for disposing of waste on the Ogle property. Furthermore, no information is available to demonstrate MMI's culpability for this disposal. For these reasons, plus the fact that the lead contamination detected in the Ogle neighborhood may be attributable to other sources because this neighborhood is used as a dumping ground by other local industries (PRC 1994b), it is impossible to adequately attribute this lead contamination to the MMI site.

Elevated lead concentrations were also detected in surface soil samples collected from the Valleyview Apartments complex and from recreational grounds in Tremont Valley Park (see Section 3.3.2). Although MMI is a suspected source of lead contamination in these areas, existing data cannot be used to rule out other industrial sources.

An area of surficial soil contamination has been documented on the site property by means of sampling conducted by CTI in December 1990 and by EPA TAT in July 1992. An area measuring 78,000 ft^2 was defined by this sampling as having elevated lead levels at the ground surface. The boundaries of this area are roughly defined by MMI's battery storage area, the site's southern border, and the site's container storage area (E&E 1992; CTI 1991a). Lead concentrations in on-site surface soil samples collected by EPA TAT ranged from 6,020 to 115,000 mg/kg. Lead concentrations in background surface soil samples collected CTI and EPA TAT ranged from 40 to 229 mg/kg (E&E 1992, CTI 1991a).

On-site targets of potential exposure to contaminated surface soils and waste materials include at least 14 employees who worked at MMI, and an estimated 7,279 people who reside or work within a 1-mile radius of the site (Frost 1994). Access to the site is restricted by a fence that surrounds the property. There is no record of the site being used for recreational purposes.

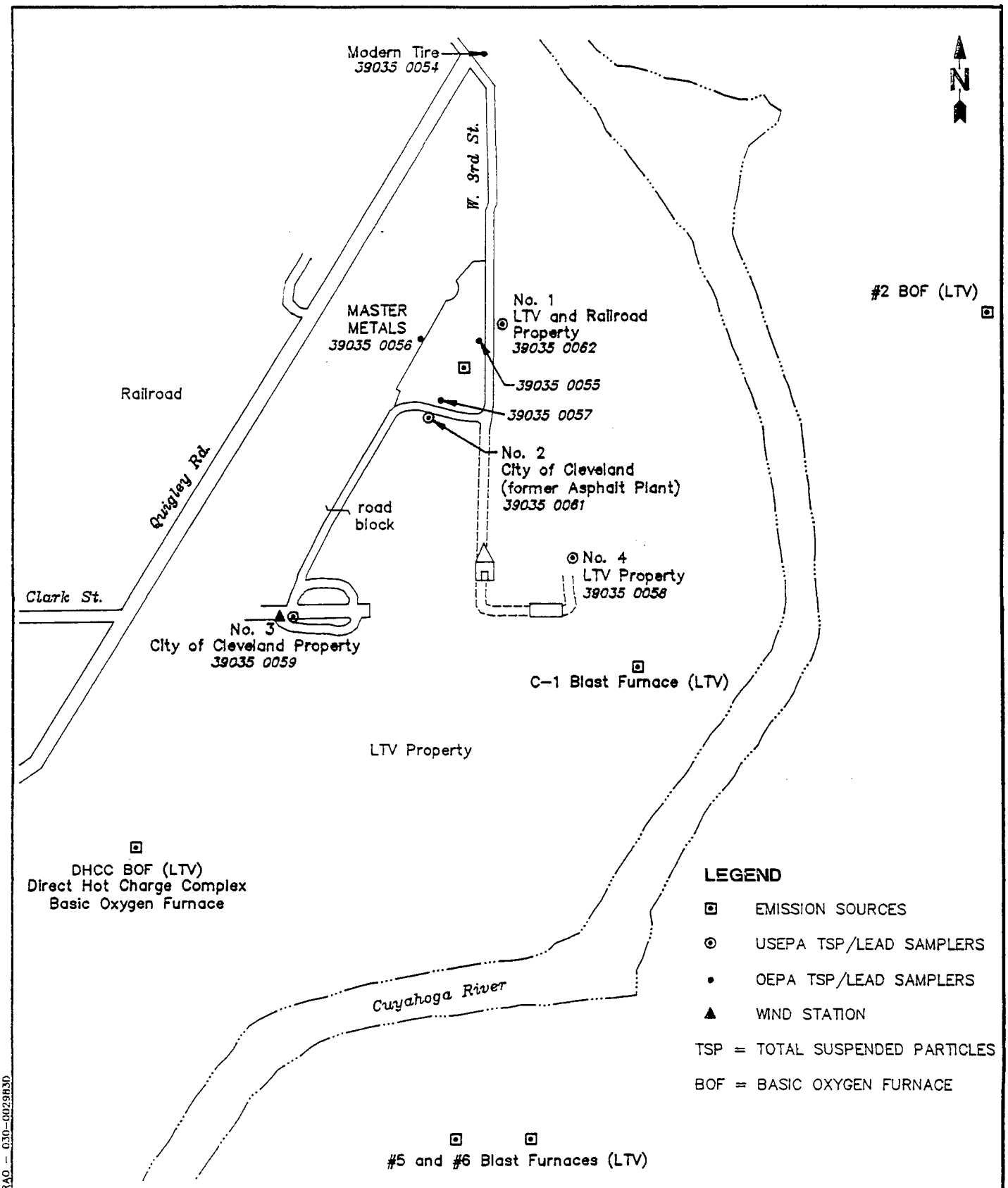
6.4 AIR MIGRATION PATHWAY

Previous air sampling investigations indicate that lead has been released to the air from the MMI site. OEPA and EPA collected analytical data from air monitoring stations between 1992 and 1993 (see Figure 3) (EPA 1993a). The results of air sampling indicate that the furnace stacks and various uncontained waste piles containing lead-bearing feed materials have released lead into the air via wind dispersal.

EPA conducted air sampling every third day during 1993. Upwind and downwind samples were collected for comparison purposes (see Table 2 and Figure 3 for information regarding the air monitoring stations). All the samples were analyzed by EPA's Central Regional Laboratory in Chicago, Illinois, for total suspended particulates and lead concentrations. Table 3 presents a representative sampling of lead concentrations in air measured upwind and downwind of the MMI site between January and August 1993.

No major obstructions are located between the sources and the air monitoring stations. However, during the summer of 1992, MMI erected a 12- to 14-foot corrugated fence and a sprinkler system between the stacks and Air Monitoring Station No. 39-035-0062 in an attempt to reduce the lead concentrations detected in the monitors (PRC 1994a). This may have impacted the amount of lead migrating off site; however, the analytical results obtained from the air monitoring stations do not conclusively demonstrate this. Additional information regarding the air monitoring stations is listed in Table 3 (EPA 1993a).

On numerous occasions, the air samples collected downwind of MMI indicated a significant release of lead when compared to the upwind samples (see Table 3). Downwind samples exceeded the concentrations detected in the upwind samples by as much as 500 times and also exceeded the NAAQS by as much as 33 times (EPA 1993a).



MASMET13.DWG - 06/29/94 - RAO - 030-0029830

SOURCE: MODIFIED FROM OEPA AIR DIVISION

MASTER METALS, INC.
CLEVELAND, OHIO

FIGURE 3
AIR MONITORING LOCATIONS

ENVIRONMENTAL MANAGEMENT, INC.

TABLE 3

SUMMARY OF EPA AIR DATA

Date	Concentration of Lead in Air ($\mu g/m^3$) EPA Air Monitoring Station Identification Number 39-035- 0058	0059	0061	0062	Wind Direction	Upwind Air Monitor ID No./ Concentration of Lead in Air ($\mu g/m^3$)	Downwind Air Monitor ID No./ Concentration of Lead in Air ($\mu g/m^3$)	Ratio of Downwind Concentration to Upwind Concentration
01/30/93	0.30	0.07	0.10	50.00	WSW	0061/0.10	0062/50.00	50/0.1 = 500
02/05/93	0.65	0.10	1.00	20.00	WSW	0061/1.0	0062/20.00	200/1 = 20
03/01/93	0.10	0.20	0.20	38.00	WSW	0061/0.2	0062/38.00	38/0.2 = 190
03/07/93	0.05	0.20	--	22.00	SSW	0059/0.20	0062/22.00	22/0.2 = 110
04/18/93	0.07	0.10	0.20	30.00	WSW	0061/0.2	0062/30.00	30/0.2 = 150
05/24/93	<0.06	0.08	0.30	13.00	SSW	0061/0.3	0062/13.00	13/0.3 = 43
06/20/93	<0.05	<0.06	0.10	16.00	SSW	0061/0.1	0062/16.00	16/0.1 = 160
06/29/93	0.09	0.72	6.70	1.20	NNE	0062/1.2	0061/6.70	6.7/1.2 = 6
08/10/93[a]	0.20	0.09	0.20	9.30	WSW	0061/0.20	0062/9.30	9.3/0.2 = 46

Notes:

-- No sample was collected

[a] MMI furnaces were shut down in August 1993.

Ref. EPA 1993a.

TABLE 2

AIR MONITOR INFORMATION

Air Monitoring Station Identification Number	Distance from Road (meters)	Probe Height (meters)	Elevation Above Mean Sea Level (meters)
39-035-0062	1	3	181
39-035-0061	1	2	181
39-035-0059	21	2	184
39-035-0058	415	2	183

Because downwind samples were collected off the MMI site and within a 0.25 mile radius from the site, all the people working, residing, or attending school within a 0.25 mile radius of the site are considered to be exposed to airborne lead concentrations exceeding NAAQS. At least 165 residents, 63 LTV workers, and 14 MMI workers fall into this category (Frost 1994; PRC 1993e and 1994c). Of the 63 LTV workers, 62 work in the LTV Power Plant and one person works in the LTV warehouse (see Figure 1 for locations). Table 4 provides the estimated number of people found within each target distance ring for the MMI site.

TABLE 4

POTENTIAL AIR MIGRATION PATHWAY POPULATION

Radius (miles)	Residents	Workers and Students
1/4 to 1/2	950	Unknown
1/2 to 1	6,101	Unknown
1 to 2	51,774	Unknown
2 to 3	82,914	Unknown
3 to 4	122,196	Unknown

No known sensitive environments exist within 0.25 mile of the MMI site. No known sensitive environments are documented within a 4-mile radius of the site.

7.0 SUMMARY

Based on documentation found in EPA, OEPA, and OSHA files and additional information gathered during the PRC site evaluation, the MMI site will receive a preliminary HRS score of greater than 28.50.

Available information indicates that a release to the air migration pathway has occurred and that nearby residents and workers have been exposed to contaminant concentrations exceeding applicable NAAQS.

Releases to groundwater, surface water, and soil also appear likely to have occurred; however, groundwater is not used as a source of drinking water in the area. Although surface water is used for drinking water supplies and fishing, the likelihood of attributing detectable quantities of surface water contaminants to releases from MMI appears low. Similarly, the likelihood of attributing off-site soil contamination directly to MMI is low due to alternative potential sources.

REFERENCES

A.T. Kearney. 1987. Final Resource Conservation and Recovery Act (RCRA) Facility Assessment Report for Work Assignment No. R05-02-42; Master Metals, Inc., Cleveland, Ohio. March 24.

City of Cleveland. 1987. Permit to Operate. From Gary Nied, Division of Air Pollution Control. To Douglas Mickey, President, Master Metals Incorporated (MMI). April 3.

City of Cleveland. 1988. Division of Fire Prevention Bureau. Letter Regarding Violations of the Municipal Code. From James McNamee, Chief of the Division of Fire. To Douglas Mickey, President, MMI. October 13.

City of Cleveland. 1993. Letter and Informational Booklet Regarding Cleveland Water Supply. From Gwen Bryant, Public Relations Officer, Division of Water. To Cynthia Schultz, Environmental Scientist, PRC. November 12.

Compliance Technologies, Inc. (CTI). 1991a. Subsurface Investigation Report from CTI to MMI. January 21.

CTI. 1991b. Groundwater Analysis Report from CTI to MMI. January 17.

Ecology & Environment, Inc. (E&E). 1992. Site Assessment Report. From E&E. To MMI. Project No. TAT-05-23-0240

E&E. 1993. Site Assessment Report. From E&E. To MMI. Project No. TAT-23-3044. September 24.

Envisage Environmental Incorporated (EEI). 1987a. Partial Facility Closure Plan of Action Report. From David K. Munson. to Douglas Mickey. August 13.

EEI. 1987b. Letter Regarding Extraction Procedure Toxicity Analysis of MMI Slag Material. From EEI. To MMI. November 2.

EEI. 1987c. Letter Regarding Rotary Furnace Slag Analysis Conducted September 28, 1987. From EEI. To MMI. October 16.

EEI. 1988. Closure Results: Drilling Core Samples Conducted March 16, 1988 Report. From EEI. To MMI. March 16.

EEI. 1990a. RCRA Part B Permit Application for MMI. April 2.

EEI. 1990b. Letter Regarding Corrosivity of Furnace Brick, Sewer Sludge and Battery Casing at MMI. From Thomas J. Monito. To Rudy Zupan, MMI. October 15.

Environment One Incorporated (EOI). 1993a. MMI Background Sampling Results. Holmden Avenue, Cleveland, Ohio Report. From Anthony A. Dattilo, President. To Paul Anderson, Ohio Environmental Protection Agency (OEPA), Northeast Divisional Office (NEDO). January 21.

EOI. 1993b. Letter Regarding Ogle Property Closure. From David T. Boyes, Project Engineer. To Paul Dolensky, OEPA. July 22.

Frost Associates (Frost). 1994. Contracts Report for Master Metals, Inc. From Bob Frost, President. To Cynthia Schultz, Environmental Scientist, PRC. May 4.

Inviron, Inc. 1992. Site Plan.

Kemron Environmental Services (KES). 1992. Chemical Analysis Report for MMI Soil Samples. Work No. 1C920304-1HW. March 18.

Master Metals, Inc. (MMI). 1980. U.S. Environmental Protection Agency (US EPA) Form 3510-1(6-80) RCRA Part A Application. From Douglas Mickey, President. To US EPA. November 19.

MMI. 1987. OEPA Facility Annual Hazardous Waste Report. EPA Form No. 9020. From Douglas Mickey, President. To Mark Bergman. February 26.

MMI. 1990a. Revised Contingency Plan. From Douglas K. Mickey, President. To Kevin M. Pierard, Acting Chief, US EPA. November 27.

MMI. 1990b. Industrial User — Pretreatment Baseline Report Form. September 5.

MMI. 1990c. Letter Regarding August Status Report from Jerry L. Moody, Vice President. To US EPA. September 12.

MMI. 1991. Uniform Hazardous Waste Manifest. From Rudy Zupan, Title Unknown. To Michigan Department of Natural Resources (MDNR). November 1.

MMI. 1992. Uniform Hazardous Waste Manifest. From Rudy Zupan, Title Unknown. To MDNR. January 2.

MMI. 1993a. Letter Regarding Pretreatment Facility Shutdown. From Douglas Mickey, President. To Frank Schuschu, Title Unknown, Northeast Ohio Regional Sewer District (NEORSD). August 20.

MMI. 1993b. Letter Regarding Holmden Avenue Findings. From Douglas Mickey, President. To Paul Dolensky, Title Unknown, OEPA. August 20.

National Institute for Occupational Safety and Health (NIOSH). 1990. *NIOSH Pocket Guide to Chemical Hazards.* U.S. Department of Health and Human Services. June.

NEORSD. 1980a. Letter Regarding Master Metals (N&L Industries). From R. Zeller and F. Intihar, Titles Unknown. To File. May 16.

NEORSD. 1980b. Minutes of Meeting Between MMI and NEORSD. June 10.

NEORSD. 1988a. Laboratory Analysis Sheet for MMI Sample No. 89-9. From F. Schuschu, Title Unknown. January 11.

NEORSD. 1988b. Laboratory Analysis Sheet for MMI Sample No. 1635-8. From F. Schuschu, Title Unknown. November 3.

NEORSD. 1990. Letter Regarding Baseline Monitoring Report. From Frank Schuschu, Investigator. To James Ammons, MMI. August 20.

NEORSD. 1992. Greater Cleveland Area Environmental Quality Assessment 1989-90. July.

Ohio Environmental Protection Agency (OEPA). 1983. Interoffice Memorandum Regarding MMI Operations. From Mark Bergman. To Melinda Becker, DHMM, NEDO. July 11.

OEPA. 1984. Potential Hazardous Waste Site Preliminary Assessment. From Pam Wicks, Northeast Ohio District. July 5.

OEPA. 1986a. Letter Regarding Part B Deficiencies. From Edith Ardiente, Chief Technical Programs Director. To Douglas Mickey, President, MMI. January 16.

OEPA. 1986b. Letter Regarding Part B Deficiencies. From Tom Carlisle, Acting Section Manager, Engineering Section, Division of Solid and Hazardous Waste Management. To George Hamper, Chief USEPA. June 16.

OEPA. 1986c. Model Facility Management Plan for Master Metals, Inc. OHD 097 613 871. From Mary P. Logan. To file. July 8.

OEPA. 1987. Record of Telephone Conversation Regarding Disposal of MMI Waste At Mark's Cement. Between Mark Bergman, OEPA Northeast District Office and an anonymous caller. September 4.

OEPA. 1988a. Letter Regarding MMI Lead Slag Waste. From Mark Bergman, Environmental Scientist. To Douglas Mickey, President, MMI. April 15.

OEPA. 1988b. Interoffice Memorandum. From Bob Davic, Title Unknown. To Mark Bergman, Environmental Scientist. May 3.

OEPA. 1988c. Letter Regarding Battery Acid Dripping Onto the Ground. From Mark Bergman, Environmental Scientist. To Douglas Mickey, President, MMI. July 22.

OEPA. 1990. Interoffice Memorandum. From Pam Allen, Central Office. To Mark Bergman, NEDO. April 11.

OEPA. 1991. Director's Findings and Orders for MMI. From Donald R. Chregardus, Director. To Douglas Mickey, President, MMI. October 24.

OEPA. 1992a. Letter Regarding Final Findings and Orders for Lead Emitting Sources. From Donald R. Chregardus, Director. To Douglas Mickey, President, MMI. August 3.

OEPA. 1992b. News Release Regarding MMI Shutdown. From Donald R. Chregardus, Director. To Douglas Mickey, President, MMI. August 3.

OEPA. 1992c. Final Findings and Orders for MMI. From Donald R. Chregardus, Director. To Douglas Mickey, President, MMI. October 14.

OEPA. 1993a. Letter Regarding MMI Air Data and Accompanying Aerometric Information Retrieval System Database Summary Sheets. From Gary L. Engler, Division of Air Pollution Control, Technical Services Section. To Cynthia Schultz, Environmental Scientist, PRC. November 2.

OEPA. 1993b. Letter Regarding Violation of the October 14, 1992, Final Findings and Orders Issues at MMI. From Donald R. Chregardus, Director. To Douglas Mickey, President, MMI. August 5.

OEPA. 1993c. News release regarding MMI plant shutdown order. From Donald R. Chregardus, Director. To Douglas Mickey, President, MMI. August 6.

OEPA. 1993d. Letter Regarding Holmden Avenue Remediation. From Paul Dolensky, Title Unknown. To Douglas Mickey, President, MMI. August 17.

Plain Dealer. 1990. "Plants Lead Level May Bring U.S. Court Order." Donald Sabat, Staff Writer. May 26.

PRC Environmental Management, Inc. (PRC). 1986. Loss of Interim Status Inspection Report - Checklist for Master Metals, Inc., ID No. OHD 097 613 871. From Daniel T. Chow to U.S. Environmental Protection Agency (EPA). June 24.

PRC. 1993a. Record of Telephone Conversation Regarding MMI Violations. Between Cynthia Schultz, Environmental Scientist and Mark Switzer, Title Unknown, U.S. Department of Labor (DOL), Occupational Safety and Health Administration (OSHA). October 29.

PRC. 1993b. Off-Site Reconnaissance Logbook for the MMI Site. OHD 097 013 871. Cynthia Schultz, Environmental Scientist. December 15.

PRC. 1993c. Record of Telephone Conversation Regarding Cleveland Water Supply. Between Cynthia Schultz, Environmental Scientist and Gwen Bryant, Public Relations Officer, Division of Water, City of Cleveland. November 11.

PRC. 1993d. Record of Telephone Conversation Regarding Sewer Discharge. Between Cynthia Schultz, Environmental Scientist and Jim Weber, Title unknown, NEORSD. November 4.

PRC. 1993e. Record of Telephone Conversation Regarding MMI Violations. Between Cynthia Schultz, Environmental Scientist, PRC, and Joe Warner, DOL, OSHA. December 2.

PRC. 1994a. Record of Telephone Conversation Regarding Site Activity and Installation of Fencing and Sprinkler System. Bewteen Cynthia Schultz, Environmental Scientist, and George Young, Title Unknown, Cleveland Division of Air Pollution Control. January 6.

PRC. 1994b. Record of Telephone Conversation Regarding Ogle Property. Between Cynthia Schultz, Environmental Scientist, and Paul Dolensky, Title Unknown, OEPA. January 5.

PRC. 1994c. Record of Telephone Conversation Regarding LTV Workers within 0.25 Mile of MMI Site. Between Cynthia Schultz, Environmental Scientist, and Rich Nemeth, Manager of Environmental Control, Cleveland Works. May 4.

RECRA Environmental, Inc. 1991. Letter Regarding Analytical Results for MMI. From Deborah Kinecki, Vice President. To Steven McBride, Title Unknown. Project No. R910812-2. September 11.

Rutigliano & Associates Co. L.P.H. 1993. Letter Regarding MMI Cleanup. From Joseph Rutigliano, Title Unknown. To Donald Schreganders, Director, OEPA. November 4.

U.S. Department of Labor (DOL), Occupational Safety and Health Administration (OSHA). 1987 and 1988. Citations and Notice of Penalties for MMI. September 3 through February 24.

DOL. 1990a. OSHA Notice of Alleged Imminent Danger to Employer and Employees. May 22.

DOL. 1990b. OSHA Citations and Notice of Penalties for MMI. January 11 through March 23.

U.S. District Court. 1990. Court Records. United States of America, Plaintiff versus Master Metals, Inc., Defendant. CWM Action No. C87-1471. Consent Decree. June 15.

U.S. District Court. 1992. Court Records. United States of America versus Douglas Mickey and Phillip S. Howard. C.R. No. 1:92CR0380. Unknown date.

U.S. Environmental Protection Agency (EPA). 1987. RCRA Visual Site Inspection Interview Notes. Mary Logan, Title Unknown. February 10.

EPA. 1990a. Letter Regarding Battery Cracking Plan Disapproval. From Kevin Pierard, Acting Chief, EPA, RCRA Enforcement Branch. To Douglas Mickey, President, MMI. November 8.

EPA. 1990b. Letter Regarding Facility Inspection Plan Disapproval. From Kevin Pierard, Acting Chief, EPA, RCRA Enforcement Branch. To Douglas Mickey, President, MMI. November 9.

EPA. 1990c. Letter Regarding Contingency Plan Comments. From Kevin Pierard, Acting Chief, EPA, RCRA Enforcement Branch. To Douglas Mickey, President, MMI. November 9.

EPA. 1990d. Letter Regarding Waste Analysis Plan Disapproval. From Kevin Pierard, Acting Chief, EPA, RCRA Enforcement Branch. To Douglas Mickey, President, MMI. November 9.

EPA. 1990e. Letter Regarding MMI Closure Plan. From Kevin Pierard, Acting Chief, EPA, RCRA Enforcement Branch. To Douglas Mickey, President, MMI. December 27.

EPA. 1991. Letter Regarding Financial Assurance for Closing and Operating Hazardous Waste Units. From Joseph M. Boyle, Acting Chief, RCRA Enforcement Branch. To Douglas Mickey, President, MMI. January 3.

EPA. 1992. Region 5 Air and Radiation Division Issue Paper Regarding Ambient Lead Monitor Readings at MMI. From John Gaitskill, Title Unknown. To File. June 30.

EPA. 1993a. Aerometric Information Retrieval System, Air Quality Subsystem Data for MMI. August.

EPA. 1993b. Letter Regarding MMI Air Sampling Results. From Mark Conti, Environmental Engineer. To Shirley Mitchell, Chief Air Enforcement Division. March 12.

U.S. Geological Survey (USGS). 1984. Topographic Map for Cleveland South Quadrangle. 7.5-Minute Series.

USGS. 1988. "Water Resources Data, Ohio, Water Year 1988". Volume 2. St. Lawrence River Basin. Statewide Project Data.

Wadsworth-Alert Labs (WAL). 1987. Analytical Report for MMI. Project No. W910917. October 7.

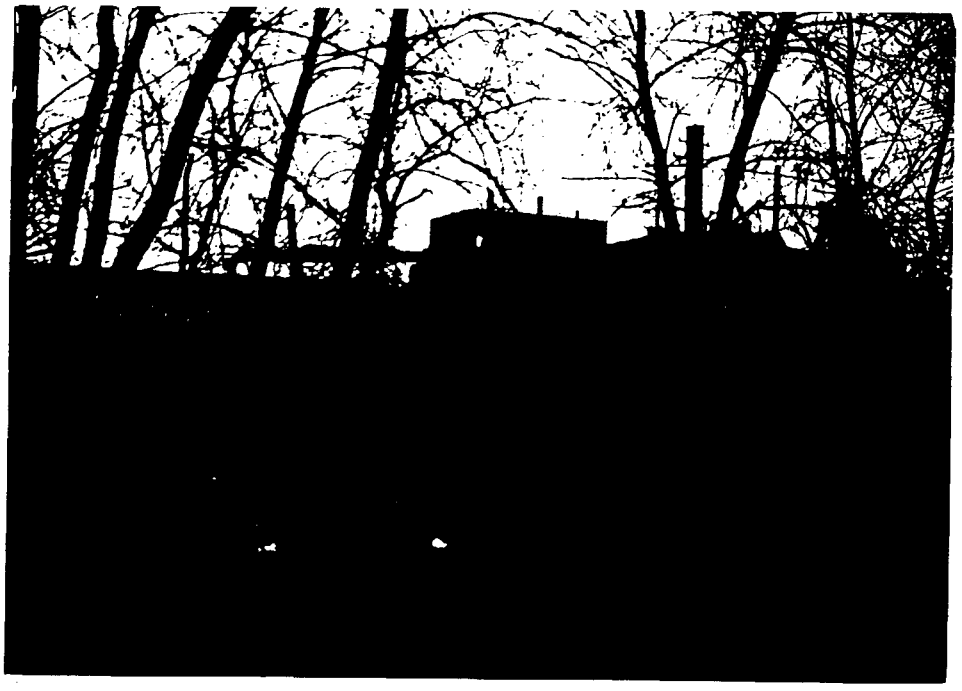
WAL. 1991. Analytical Report for MMI. Project No. W910917-1. October 7.

Woodward-Clyde Consultants (WWC). 1990. Partial Closure Plan, MMI, Cleveland, Ohio. March 16.

APPENDIX A

PHOTOGRAPHIC LOG

(Seven Pages)



Location: Southern end of site
Photograph No. 1 along West Third Street
Orientation: North Date: 12/15/93
Description: This photographs shows storage bins possibly containing lead-bearing waste materials in foreground and furnace stacks rising from on-site buildings in background.

Photograph No. 2 Location: Front gate of MMI
Orientation: West Date: 12/15/93
Description: This photograph shows the truck that was observed during PRC's off-site reconnaissance; note that the truck is being loaded with materials for transport off site.

Photograph No. 3
Orientation: South
Location: MMI front gate, 2850 West Third Street, Cleveland, Ohio
Date: 12/15/93
Description: This photograph shows the corrugated fence and sprinkler system separating the furnace stacks from Air Monitoring Stations 39-035-0055 and its collocated air monitoirng station

Photograph No. 4
Orientation: North
Location: South end of MMI
Date: 12/15/93
Description: This photograph shows Air Monitoring Station 39-035-0057, which is located between West Third Street and facility fence.

Photograph No. 5 Location: MMI, West Third Street, across from front gate
Orientation: North Date: 12/15/93
Description: This photograph shows Air Monitoring Station 39-035-0062, which was operated by EPA, where elevated lead concentrations have consistently been reported.

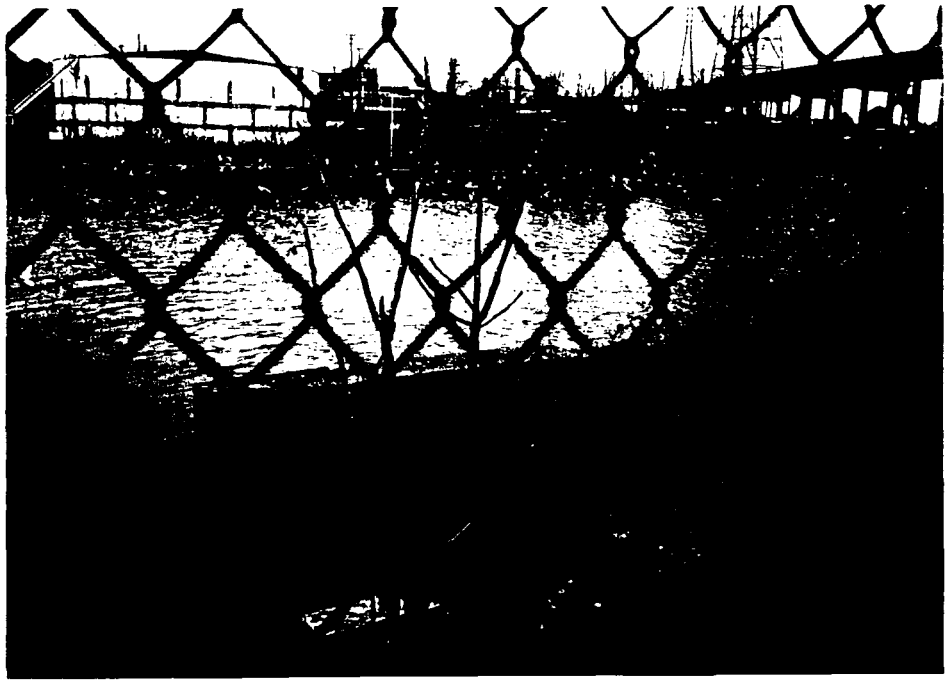
Photograph No. 6 Location: Across West Third Street at southern border
Orientation: South Date: 12/15/93
Description: This photograph shows Air Monitoring Station 39-035-0061 and its collocated Air Monitoring Station which was operated by EPA and located adjacent to an abandoned asphalt company owned by the City of Cleveland.

Photograph No. 7 Location: 1157 Holmden Avenue, Cleveland, Ohio
Orientation: South Date: 12/15/93
Description: This photograph shows the front yard of former Ogle residence; note the yellow flagging behind the house.

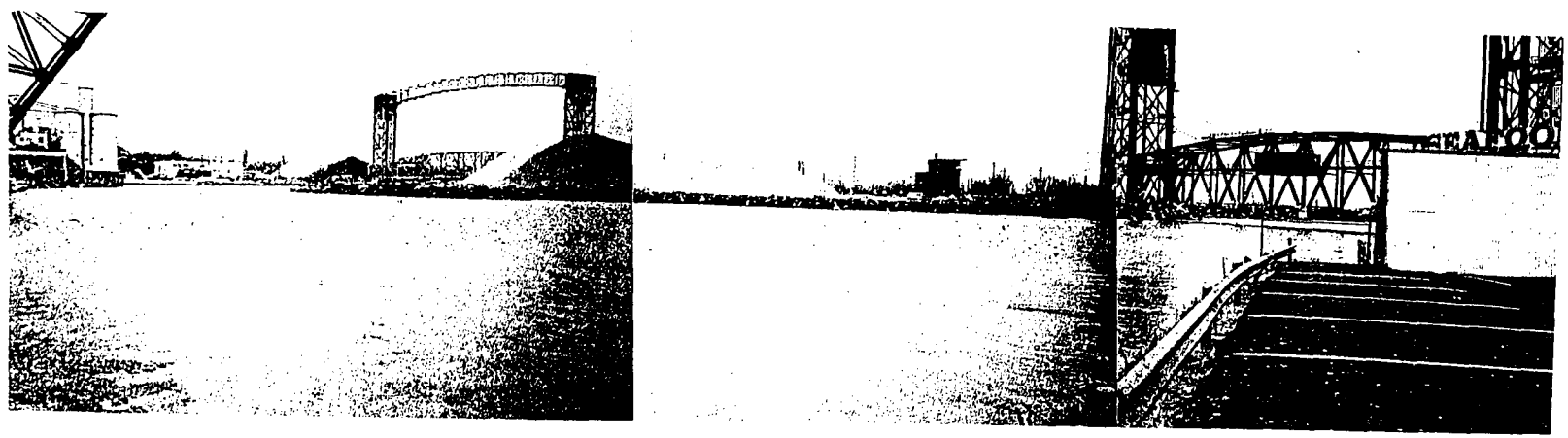
Photograph No. 8 Location: 1157 Holmden Avenue
Orientation: South Date: 12/15/93
Description: This photograph shows the side yard associated with the Ogle residence where soil was excavated and replaced with rock; LTV is located at the base of a steep cliff immediately behind the house.

Photograph No. 9
Orientation: South
Location: Area 1 in U.S. Environmental Protection Agency (EPA) Technical Assistance Team (TAT) Report
Date: 12/15/93
Description: This photograph shows the Valleyview Apartments complex, which is located 0.4 mile northwest of site, and the playground where the EPA TAT collected soil samples.

Photograph No. 10
Orientation: Northwest
Location: Area 2 in EPA TAT Report
Date: 12/15/93
Description: This photograph shows the Tremont Valley Park, which is located 0.4 mile west of the site; TAT collected soil samples from this park.



Photograph No. 11 Location: Cuyahoga River
Orientation: Northeast Date: 12/15/93
Description: This photograph shows the probable point of entry into the Cuyahoga River from the Mary Street Pumping Station.



Photographs No. 12A, 12B, 12C
Orientation: Southwest to northwest
Location: Cuyahoga River empties into Lake Erie
Date: 12/15/93
Description: This photograph provides a panoramic view of the Cuyahoga River approximately 4 miles downstream from the site; both branches of the river immediately empty into Lake Erie.